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## IN THE CLAIMS:

- (Previously presented) A device, comprising a housing holding a sensor, said 1. housing having an inner surface, said inner surface having an inner-surface-inside dimension, said sensor including a coil and a captive core, wherein said coil has a coil inside diameter, wherein an electrical measurement of said coil provides information about at least one from the group including displacement of said captive core and velocity of said captive core, further wherein said coil has an axis extending in a first direction, wherein said housing has a minimum outside dimension that is less than 3.00 mm when measured perpendicular to said first direction, wherein said housing further comprises a support for said captive core, wherein said housing inner-surface-inside dimension is greater than said 10 coil inside diameter, wherein said support includes a first bearing and a second 11 bearing, wherein said captive core has a stroke length, wherein said captive core 12 has a first length of contact with said first bearing, wherein said captive core has a 13 second length of contact with said second bearing, wherein said first length of 14 contact is less than said stroke length and wherein said second length of contact is 15 less than said stroke length, wherein said second bearing has a second-bearing-16 outside diameter that is greater than said coil inside diameter.
  - 1 2. (Original) A device as recited in claim 1, wherein said housing has a minimum 2 outside dimension that is less than 2.50 mm when measured perpendicular to said 3 first direction.
- 3. 1 (Original) A device as recited in claim 1, wherein said housing has a minimum 2 outside dimension that is less than 2.00 mm when measured perpendicular to said 3 first direction.

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1	4.	(Original) A device as recited in claim 1, wherein said nousing has a minimum
2		outside dimension that is less than 1.80 mm when measured perpendicular to said
3.		first direction.
1	5.	(Original) A device as recited in claim 1, wherein said housing has a minimum
2 .		outside dimension that is less than 1.60 mm when measured perpendicular to said
3		first direction.
1	6.	(Original) A device as recited in claim 1, wherein said housing has a minimum
2		outside dimension that is less than 1.40 mm when measured perpendicular to said
3		first direction.
1	7.	(Original) A device as recited in claim 1, wherein said captive core extends into
2		said coil.
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1	8.	(Previously presented) A device as recited in claim 1, wherein said captive core
2		has a first portion having a first diameter, wherein said captive core further
3		includes a second portion having a diameter greater than said first diameter for
4		retaining said core within said housing.
1	9.	(Original) A device as recited in claim 8, wherein said first bearing is connected to
2	,	said housing, wherein said core slides within a hole in said first bearing.
2		said housing, wherein said core shaes within a hole in said hist bearing.
1	10.	(Previously presented) A device as recited in claim 8, wherein said second bearing
2		is mechanically mounted to at least one from the group including said coil and
3		said housing, wherein said core slides within a first hole in said first bearing and
4		wherein said core slides within a second hole in said second bearing.

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1	11.	(Original) A device as recited in claim 8, wherein said second bearing is integral
2		with said second portion and mechanically connected to said core, wherein said
3		second bearing moves with said core.
1	12.	(Original) A device as recited in claim 11, wherein said first bearing and said
2 ·		second bearing are jewel bearings.
1	13.	(Original) A device as recited in claim 11, wherein said captive core comprises
2		steel, stainless steel, titanium, aluminum, plastic, or a super-elastic material.
1	14.	(Original) An sensor as recited in claim 13, wherein said superelastic material
2		comprises nitinol.
1	15.	(Original) A device as recited in claim 1, wherein said displacement or velocity
2		sensor comprises an inductive sensor or an eddy current sensor.
1	16.	(Original) A device as recited in claim 15, wherein said inductive sensor or said
2		eddy current sensor is a one-coil device.
1	17.	(Original) A device as recited in claim 15, wherein said inductive sensor or said
2		eddy current sensor is a two-coil device.
1	18.	(Original) A device as recited in claim 15, wherein said inductive sensor or said
2		eddy current sensor is a three-coil device.
1	19.	(Original) A device as recited in claim 1, wherein said sensor further comprises a
2		spring to provide a return force to said core.

		•
1.	20.	(Original) A device as recited in claim 19, wherein said core extends through said
2		spring and into said coil.
1	21.	(Original) A device as recited in claim 1, wherein said core includes a
2		ferromagnetic material.
1	22.	(Original) A device as recited in claim 21, wherein said ferromagnetic portion
	22.	comprises iron, nickel, ferrite, or steel.
2		comprises non, moker, retrice, or sect.
1	23.	(Original) A device as recited in claim 1, wherein said core further comprises a
2		contact point for making contact with an object to be measured, wherein said
3		contact point is made of a hard material that resists wear.
	24.	(Original) A device as recited in claim 23, wherein said hard material comprises
1	24.	
2		alumina, ruby, sapphire or hardened steel.
1	25.	(Previously presented) A device as recited in claim 19, wherein said core further
2		comprises a core stop to capture said core within said housing, wherein said core
3		stop further limits extension of said spring.
1	26.	(Previously presented) A device as recited in claim 25, wherein said housing has
2		a housing inside diameter, and wherein said core stop is sized to have an outside
3		diameter approximately equal to said housing inside diameter to provide a bearing
4		function for guiding said core.

27.

1 2 (Original) A device as recited in claim 1, further comprising lead wires

electrically connected to said coil and extending to a circuit.

- (Previously presented) A device for providing displacement information, 28. 1 comprising a housing having an inner surface, said inner surface having an inner-2 surface-inside dimension, said housing holding a displacement sensor and a 3 guidance mechanism, said displacement sensor including a coil and a captive core, 4 said coil having a coil inside diameter, said captive core having a core-outside 5 dimension, wherein said guidance mechanism comprises a first bearing and a 6 second bearing for guiding said core, wherein said first bearing is connected to 7 said housing, wherein said first bearing has an axial hole having an axial-hole 8 dimension about equal to said core-outside dimension, wherein said core slidably 9 extends through said axial hole, wherein said second bearing has a second-10 bearing-outside dimension about equal to said inner-surface-inside dimension, 11 wherein said guidance mechanism is for resisting lateral movement of said core 12 while allowing axial movement of said core into and out of said coil, wherein said 13 inner-surface-inside dimension is greater than said coil inside diameter, wherein 14 said captive core has a stroke length, wherein said captive core has a first length 15 of contact with said first bearing, wherein said captive core has a second length of 16 contact with said second bearing, wherein said first length of contact is less than 17 said stroke length and wherein said second length of contact is less than said 18 stroke length. 19
  - 1 29. (Original) A device as recited in claim 28, wherein said second bearing is connected to said captive core.
  - 1 30. (Previously presented) A device as recited in claim 28, wherein said second bearing is connected to said housing.
- 1 31. (Previously presented) A device as recited in claim 28, wherein said second bearing is connected to said coil.

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- 32. Cancel.
- 1 33. (Original) A device as recited in claim 28, wherein said coil has an axis extending
- 2 in a first direction, wherein said housing has a housing outside dimension,
- wherein said housing has a minimum outside dimension that is less than 3.00 mm
- 4 when measured perpendicular to said first direction.
- 1 34. (Original) A device as recited in claim 28, further comprising a spring for spring
- 2 loading said core.

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- 2 super-elastic material.
- 38. (New) An sensor as recited in claim 37, wherein said superelastic material 1 2 comprises nitinol.
- 39. 1 (New) A device as recited in claim 1, wherein said first bearing includes a jewel bearing and wherein said second bearing includes a jewel bearing. 2

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1 2	40.	(New) A device as recited in claim 28, wherein said captive core comprises a super-elastic material.
		Super-Clastic Material.
1	41.	(New) An sensor as recited in claim 40, wherein said superelastic material
2_		comprises nitinol.
1	42.	(New) A device as recited in claim 28, wherein said first bearing includes a jewel
2		bearing and wherein said second bearing includes a jewel bearing.
1	43.	(New) A device as recited in claim 35, wherein said captive core comprises a
2		super-elastic material.
1	44.	(New) An sensor as recited in claim 43, wherein said superelastic material
2		comprises nitinol.
1	45.	(New) A device as recited in claim 35, wherein each of said plurality of bearings
2		includes a jewel bearing.
1	46.	(New) A device as recited in claim 35, wherein said captive core comprises a
2		super-elastic material.
1	47.	(New) An sensor as recited in claim 46, wherein said superelastic material
2		comprises nitinol.

- (New) A device, comprising sensor capable of providing a measurement of at 1. 48. least one from the group consisting of displacement and velocity, wherein said 2 sensor includes a housing holding coil, a captive core, and a plurality of bearings, 3 wherein said bearings are for supporting said captive core, further wherein said 4 coil has an axis extending in a first direction, wherein said coil has a coil inside 5 diameter, wherein each said bearing has a bearing outside diameter that is greater 6than said coil inside diameter, wherein said captive core has a stroke length, 7 wherein each said bearing has a length-of-contact in said first direction with a 8 surface capable of movement in said first direction relative to said bearing that is 9 less than said stroke length. 10
  - 1 49. (New) A device as recited in claim 48, wherein each of said plurality of bearings includes a jewel bearing.
- 1 50. (New) A device as recited in claim 48, wherein said captive core comprises a super-elastic material.
- 1 51. (New) An sensor as recited in claim 50, wherein said superelastic material comprises nitinol.
- 1 52. (New) A device as recited in claim 48, wherein said sensor further comprises a spring to provide a return force to said captive core.

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